

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						1	3	8	0	/	4	H	Signature	

Paper Reference(s)

1380/4H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 4 (Calculator)

Bounds

Past Paper Questions

Arranged by Topic

Model Answers

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers

Nil

Examiner's use only

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Team Leader's use only

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Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

You must NOT write on the formulae page.

Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

Calculators may be used.

If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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1.

$$v = \sqrt{\frac{a}{b}}$$

$a = 6.43$ correct to 2 decimal places.

$b = 5.514$ correct to 3 decimal places.

By considering bounds, work out the value of v to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

$$\begin{aligned} \text{Higher bound} &= \sqrt{\frac{6.435}{5.5135}} \\ &= 1.08034 \end{aligned}$$

$$\begin{aligned} \text{Lower bound} &= \sqrt{\frac{6.425}{5.5145}} \\ &= 1.0794 \end{aligned}$$

2 decimal places is a suitable degree of accuracy, as this was the degree given in the question.

$$v = 1.08$$

(Total 5 marks)

Q1

2. A ball is thrown vertically upwards with a speed V metres per second.

The height, H metres, to which it rises is given by

$$H = \frac{V^2}{2g}$$

where $g \text{ m/s}^2$ is the acceleration due to gravity.

$V = 24.4$ correct to 3 significant figures.

$g = 9.8$ correct to 2 significant figures.

- (i) Write down the lower bound of g .

.....9.75.....

- (ii) Calculate the upper bound of H .
Give your answer correct to 3 significant figures.

$$H = \frac{24.45^2}{2 \times 9.75}$$

$$H = 30.6565$$

.....30.7.....

(Total 3 marks)

Q2

Leave
blank

3. A field is in the shape of a rectangle.

The width of the field is 28 metres, measured to the nearest metre.

- (a) Work out the upper bound of the width of the field.

.....28.5..... metres
(1)

The length of the field is 145 metres, measured to the nearest 5 metres.

- (b) Work out the upper bound for the perimeter of the field.

$$28.5 + 28.5 + 147.5 + 147.5 = 352$$

.....352..... metres
(3)

Q3

(Total 4 marks)

4. Katy drove for 238 miles, correct to the nearest mile.
She used 27.3 litres of petrol, to the nearest tenth of a litre.

$$\text{Petrol consumption} = \frac{\text{Number of miles travelled}}{\text{Number of litres of petrol used}}$$

Work out the upper bound for the petrol consumption for Katy's journey.
Give your answer correct to 2 decimal places.

$$\begin{aligned} \text{Upper bound} &= \frac{\text{Largest possible number}}{\text{Smallest possible number}} \\ &= \frac{238.5}{27.25} \\ &= 8.75229 \end{aligned}$$

.....8.75..... miles per litre
(Total 3 marks)

Q4

5. (a) A solid cube has sides of length 5 cm.

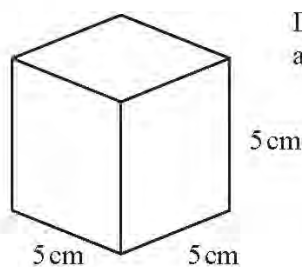


Diagram NOT
accurately drawn

Work out the total surface area of the cube.
State the units of your answer.

$$\begin{aligned}\text{Total area} &= 6 \times (5 \times 5) \\ &= 150\end{aligned}$$

$$\dots\dots\dots 150\text{cm}^2$$

(4)

The volume of the cube is 125cm^3 .

- (b) Change 125cm^3 into mm^3 .

$$1\text{cm}^3 = 1000\text{mm}^3$$

$$\therefore 125\text{cm}^3 = 125000\text{mm}^3$$

$$\dots\dots\dots 125000 \dots \text{mm}^3$$

(2)

The weight of the cube is 87 grams, correct to the nearest gram.

- (c) (i) What is the minimum the weight could be?

$$\dots\dots\dots 86.5 \dots \text{grams}$$

- (ii) What is the maximum the weight could be?

$$\dots\dots\dots 87.5 \dots \text{grams}$$

(2)

(Total 8 marks)

Q5

Leave
blank

6. The length of a line is 63 centimetres, correct to the nearest centimetre.

(a) Write down the **least** possible length of the line.

..... 62.5 centimetres
(1)

(b) Write down the **greatest** possible length of the line.

..... 63.5 centimetres
(1)

Q6

(Total 2 marks)

7 . The voltage V of an electronic circuit is given by the formula

$$V = IR$$

where I is the current in amps
and R is the resistance in ohms.

Given that $V = 218$ correct to 3 significant figures,
 $R = 12.6$ correct to 3 significant figures,

calculate the lower bound of I .

$$V = IR$$

$$I = \frac{V}{R}$$

$$\text{Lower_bound} = \frac{\text{lower_bound}}{\text{upper_bound}}$$

$$= \frac{217.5}{12.65}$$

$$= 17.19$$

.....17.19.....

(Total 3 marks)

Q7